PadhAI: Information Theory and Cross Entropy

One Fourth Labs

Expectation

What is the expectation of a distribution

1. Let us consider the random variable X that maps to the winning team amongst the 4 teams: A, B, C, D
2. P(X = x) represents the probability of team x winning where $x \in \{A, B, C, D\}$
3. Consider G(X=x), the gain associated with each of the teams if they win, where $x \in \{A, B, C, D\}$
4. Now, the expectation E(x) is given by $\Sigma_{i \in \{A,B,C,D\}} P(X = i) * G(X = i)$
5. Consider the following data

X	P(X = x)	G(X = x)
A	0.4	10000
B	0.2	2000
C	0.1	-8000
D	0.3	5000

6. Therefore, E(X) = $(0.4 * 10000) + (0.2 * 2000) + (0.1 * -8000) + (0.3 * 5000)$ = 5100